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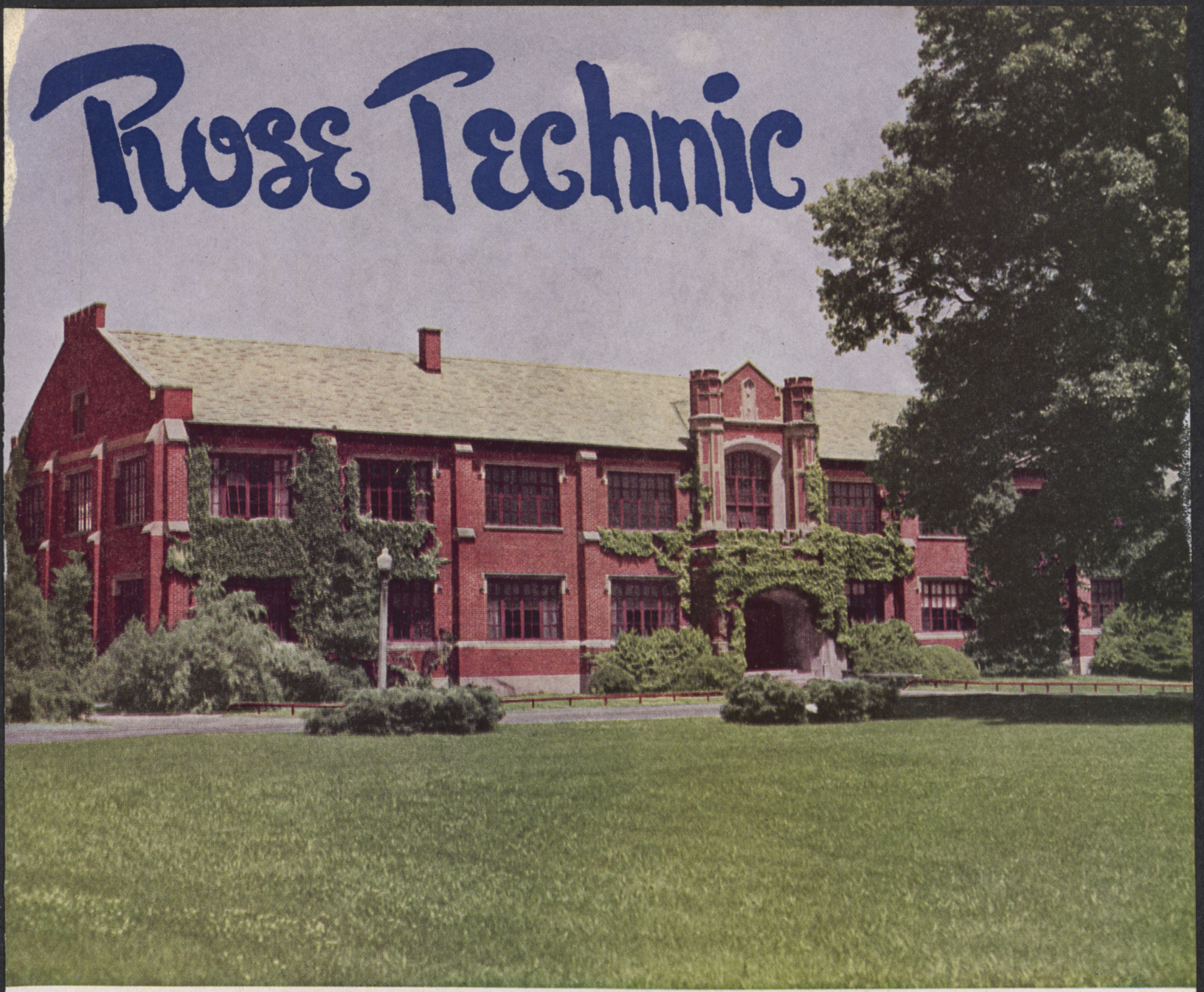

Homecoming Issue

OCTOBER, 1948

MEMBER ENGINEERING COLLEGE MAGAZINES ASSOCIATED

Machines in RCA's Lancaster Tube Plant are designed for mass production of Kinescopes—television picture tubes—at lowest possible cost.

Behind the magic of a Television Tube

Every morning, 14 tons of glass "bulbs" go down to the production lines at the RCA Tube Plant in Lancaster, Pa.

By evening, the bulbs are television picture tubes, their luminescent faces ready to glow—in television homes everywhere—with news, sports, entertainment, education, and major political events.

Born of glass, metals, and chemicals, the picture tube comes to life through flame and intense heat. Its face is coated with fluorescent material—forming a screen on which an electron gun "paints" moving images.

Each step is so delicately handled that, although RCA craftsmen are working with fragile glass, breakage is less than 1%.

Water, twice-distilled, is used to float the fluorescent material into place on the face of the tube, where it clings by molecular attraction—as an absolutely uniform and perfect coating.

Every phase of manufacture conforms to scientific specifications established by RCA Laboratories. Result: Television tubes of highest perfection—assuring sharp, clear pictures on the screens of RCA Victor home television receivers.

When in Radio City, New York, be sure to see the radio, television and electronic wonders at RCA Exhibition Hall, 36 West 49th Street. Free admission. Radio Corporation of America, RCA Building, Radio City, N. Y. 20.

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- Design of component parts such as coils, loudspeakers, capacitors.
- Development and design of new recording and reproducing methods.
- Design of receiving, power, cathode ray, gas and photo tubes.

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Also many opportunities for Mechanical and Chemical Engineers and Physicists.

RADIO CORPORATION of AMERICA

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PROF. J. L. BLOXSOME
Faculty Adviser

Rose Technic

Volume LX, No. 3 October, 1948

In This Issue

FEATURES

FRONTISPIECE

A Picture every grad remembers.

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TERRE HAUTE, IND.

SIXTY-SEVENTH COMMENCEMENT

OCTOBER 16, 1948

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Dance Friday Evening

Graduation Exercises Saturday Morning

A WARM WELCOME TO ALL ROSE MEN,
THEIR FAMILIES AND FRIENDS

YOU CAN BE SURE..IF IT'S Westinghouse

YOUR BIGGEST QUESTION

"Where shall I begin my career in industry to attain the highest degree of success?"

Probably this question has been running through *your* mind in recent months.

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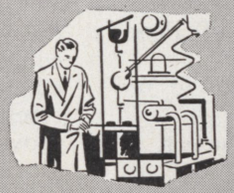
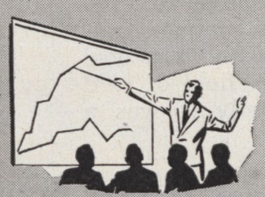
1. To show how your college training can best be applied to industry.
2. To help you find the type of work you like best and for which you are best fitted; the right man in the right job is of permanent benefit both to you and to us.
3. To give you an understanding of Westinghouse—its products, operations and many avenues of opportunity.

These objectives are realized through basic training in industrial methods and organization, plus actual job assignments to prepare the way for future responsibilities. Proof of the practical value of this course lies in the fact that the majority of key positions in Westinghouse are occupied by graduates of this course. G-10024



RESEARCH?

ENGINEERING?



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Engineering Reviews

Electronic Preservation of Food

From *Electronics*, March, 1948 by Wolfgang Huber.

Reviewed by Richard Burandt sr., e.e.

This article reveals another development in the field of electronics which, among many others, will affect the well-being of our human existence. It is the creation of the Capacitron, a unit which can bombard foods and other organic compounds with electrons. These electrons impinge within the bulk of the material, releasing energy which, in turn, kills the micro-organisms that lead to decay.

The Capacitron is of recent origin and was designed only after difficulties arose with previous methods. In 1926, a so-called Coolidge tube of 350 kv and several milliamperes output made possible the first practical experimentation in the field of food preservation. Essentially it was a confined tube from which electrons could be released. As time progressed, it was possible to obtain higher electron velocities leading to improvements in the techniques employed. With these improved facilities, it was possible to conduct tests on food, and, as is usually the case for new developments, a condition was found to exist which was not desirable—the irradiated products showed pronounced changes in taste, odor, and appearance. Some new process had to be developed which would leave the foods with the same fresh qualities but which would still destroy the micro-organisms of decay. It was realized that apparatus which produces a high voltage output with great electron intensities during short time periods was needed. Short pulses of electron impingement produced the effect desired.

The unit that can produce these pulses is the Capacitron. It is made

Concluded On Page 34

THE SALESMAN WHO CARRIED A GLASS PIPE!

"LOOK AT THIS, Mr. Irvin!" said Joe the salesman as he whisked a short length of glass pipe out of his briefcase.

"This is one reason why our food products are pure and clean. Right up to final inspection, they flow through Pyrex glass piping. We can see them all the time!

"We can keep the pipes clean easily without taking them down. And when they're clean, we can see they're clean. And what's more, food and fruit acids don't attack glass, so there's no danger of spoiling the taste!"

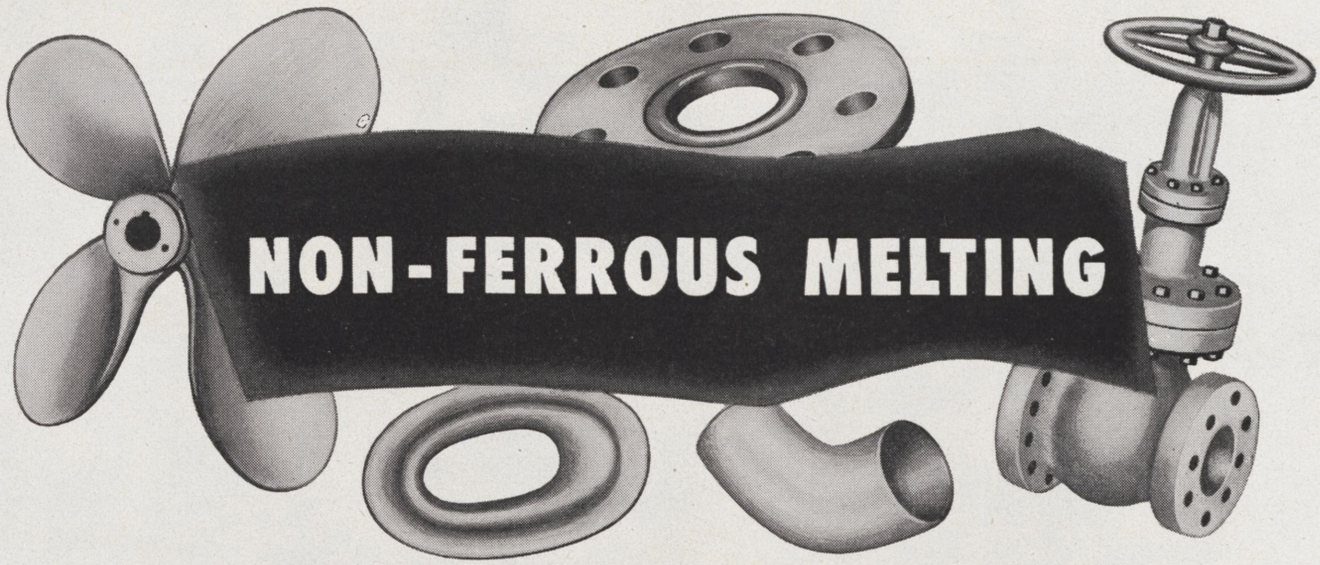
Glass pipe to guard the purity and quality of your product is only one of 37,000 things we make at Corning Glass Works.

We make the glass bowls for five best-selling coffee makers. We know the answers to a lot of questions about television because Corning has been making the glass parts for television from the start. And if you sold housewares, we could help you attract new customers with our Pyrex Flameware Double Boiler, made of the first glass ever specially developed to stand the extra shock of top-of-stove cooking.

In nearly a hundred years we've found ways to make 50,000 different kinds of glass. Some of them may someday help you improve production or cut costs. Others may suggest ways to make your product more desirable or useful to the people who buy it. Remember us when that day comes. Corning Glass Works, Corning, N. Y.

IN PYREX WARE AND OTHER CONSUMER, TECHNICAL AND ELECTRICAL PRODUCTS ▶

CORNING
means
Research in Glass



Production of Marine Hardware at ELCHINGER FOUNDRY, NEW ORLEANS, Demonstrates Efficiency of *GAS*

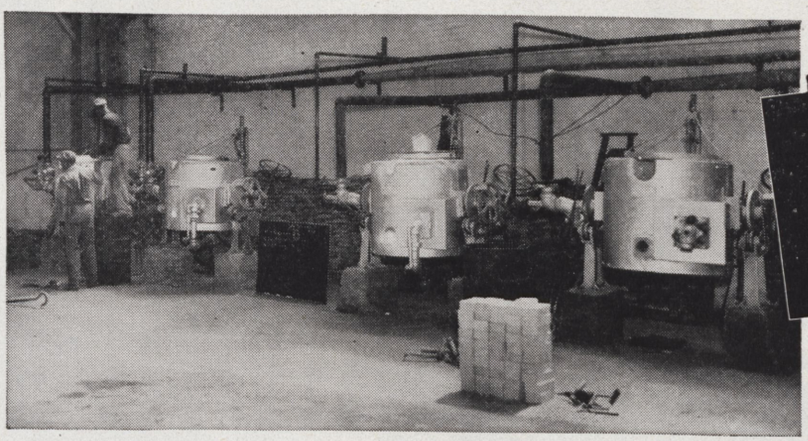
TEMPERATURE CONTROL is one of the most important factors in melting brass and bronze. And the strict control of each heat is especially important in the production of marine hardware which is subjected to extreme service conditions.

At the Charles F. Elchinger foundry in New Orleans, metallurgical supervision is facilitated by the use of four Gas-fired crucible furnaces which are so precisely regulated that any desired temperature can be maintained. This accurate control is necessary because various alloys require temperatures varying from 1850° F. to 2300° F.

But controllability is just one of the features which makes GAS the most desirable fuel for non-ferrous foundries. The four Gas-fired furnaces in the Elchinger foundry can be brought to heat in 2½ hours from a cold start or 1½ hours in succeeding heats—a simple demonstration of the speed of GAS.

The flexibility of GAS is important, whether it is used in a small foundry specializing in certain alloys, or in a large plant melting many types of non-ferrous metals. That flexibility is emphasized in the production control made possible in the Elchinger foundry by the use of four small furnaces capable of economical heating and reheating, at high speed, with GAS. In addition, cores are baked in Gas-fired ovens.

In every non-ferrous foundry operation requiring heat—for core-baking, melting, ladle heating—there's a job for GAS and modern Gas Equipment worth investigating.



MORE AND MORE...
THE TREND IS TO GAS
FOR ALL INDUSTRIAL HEATING

Employees prepare one of the four crucible furnaces for charging. These Gas-fired tilting furnaces are rated at 600 pounds each.

AMERICAN GAS ASSOCIATION

420 LEXINGTON AVENUE NEW YORK 17, N. Y.

Rally, Sons Of Rose!

Breathes there one of us with soul so dead, who never to himself hath said, "This is my own, my Alma Mater."? With this thought in mind, and with apologies to Scott, we at Rose again look forward to Homecoming festivities and the nostalgia of renewed fellowship which the occasion traditionally brings for the Sons of Rose assembled.

The occasion of Homecoming would seem perhaps to be an appropriate time for all of us, those now at the Institute and the many who will return to the campus, to consider, seriously, the privilege which we hold in common.

This is a close fellowship, which makes the heritage of Rose men valuable beyond its counterpart in countless other American schools and universities. We all learn some things in common at Rose, whether it be to run a slide rule according to Dietzgen or to drink beer exponentially. In all fairness, of course, we must admit that slide rule and tap room techniques find a place in the curriculum and campusology of a host of American institutions. But, too often, common interests are laid to sleep with the academic regalia on graduation night. Yes, Rose sends forth her Sons with yet something more than the usual, a bond which weathers the passing of the years.

You each have known the enduring comradeship with which Rose men traditionally meet one another, whether it be at Homecoming or Hong Kong. We submit that this is a manly heritage, born and strengthened among men, worthy of men, and carried forth into the reaches of our several professions to be fully understood and appreciated by those men alone who have had a part in the building of it. We further offer that the common denominator of our experience here together is a bonding as easily and rightfully enjoyed as that among common arithmetical fractions. Let's add up!

Let us then make the Homecoming festivities an occasion for wholehearted greeting among men who need no reunion.

W. O.

Vapor-Phase Cooling

By John Winters, jr., m.e.

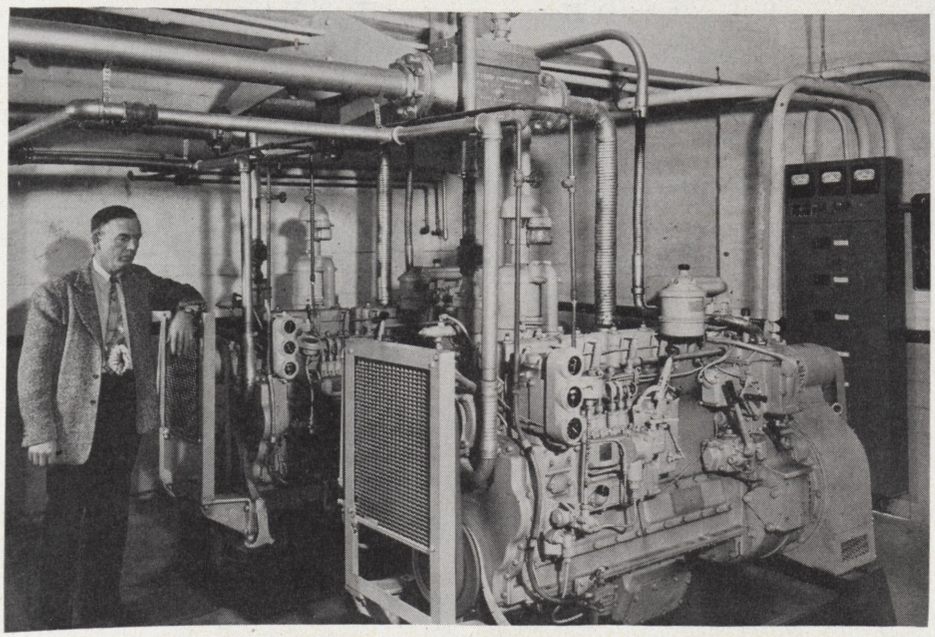
Historical

Fifteen years ago, anyone who might have suggested that internal combustion engines could operate efficiently at water jacket cooling water temperatures at or near the boiling point of the coolant would probably been severely ridiculed by the so-called "experts." Yet many operating engineers had experienced temporary conditions during a cooling system breakdown in which jacket water temperatures exceeded 140°F, the recognized limit, and had even approached 212°F without apparent injury to the engine. However, in such cases, the engine plant was usually closed down until proper cooling system repairs could be made and no one noted such operating advantages as lower fuel consumption or smoother engine performance made available through the high temperature cooling of the emergency period.

As early as 1937, English engineers were experimenting with high-temperature engine-cooling processes with special attention directed toward reduced cylinder liner wear. The research directed by E. G. Williams of the British Institute of Automotive Engineers resulted in some revealing conclusions. It was found that rapid wear occurred at cylinder wall temperatures below 194° F while at temperatures from 194° F to 536° F liner wear was almost negligible. In addition, the researchers found that while operating in the higher temperature range, none of the corrosive elements of burned fuel could condense and form such undesirable compounds as sulfuric and nitirc acids within the cylinder of the engine.

The Vapor-Phase high-temperature cooling process was developed in the United States in 1939 by Pacific Enterprise Products for the purpose of eliminating the operating difficulties of gaseous condensations of "sour" gas used as a fuel by some internal combustion engines in the West Coast oil fields. Since its inception in this country, the Vapor-Phase system has grown in popularity and field of application until today it finds use in several types of automotive, stationary, and marine engines.

The possibilities of such a system seemed particularly advantageous to diesel application because it had long been known that, of the tremendous quantities of energy stored in the fuel supplied, almost two-thirds were lost to jacket water, lubricating oil, exhaust gases, and radiation losses. Combining the high temperature cooling principle with the advantages of pressure cooling system, the Vapor-Phase system provided a very satisfactory heat balance, in which the recovery of fifty to sixty per cent of the total heat supplied was made possible.



Cut Courtesy Diesel Progress

Diesel Electric sets with jackets and manifold connected to Vapor Phase system.

Principles of the System

The system, as shown diagramatically in the accompanying figure, consists of a closed pressure circuit for the cooling water. The coolant is not drawn off immediately after a small temperature increase, but rather is forced to remain in the jacket until it reaches the boiling point, at which time steam bubbles from it in thin layers and vaporize into the "flash chamber" above. The steam passes through a condenser or some type of heat exchanger, giving up its heat to suitable coolants, and returns to the engine to begin another cycle. This circulation rate is based upon maintaining temperature differences not to exceed 20°F and is approximately 0.4 gallons per minute per brake horsepower-hour developed.

No special form of condenser need be used, standard forms of commercially available items being available for this use. Principles of the system are flexible enough to permit the installation of special equipment within the system in order to better comply with the existing heat requirements. For example, a waste heat boiler may be inserted in the system between the flash chamber and condenser or a suitable radiator may be introduced directly into the line to fulfill space heat requirements of some building, etc. Neither is a complicated system of control necessary, since the automatic control unit of the system depends entirely upon the latent heat of vaporization of the coolant used. The selection of the pressure to be used in the system determines the temperature limit, since for each pressure there is a corresponding temperature. The following table relates the pressure, temperature, and latent heat of evaporation:

Pressure Gage	Deg. F. Temp.	Heat Latent
0	212.0	970.0
1	215.3	968.1
2	218.4	966.0
3	221.4	964.1
4	224.3	962.2
5	227.1	960.4
6	229.8	958.7
7	232.3	957.1
8	234.7	955.5
9	237.1	953.9
10	239.4	952.4

The latent heat of vaporization thus constitutes the determining factor in the control. Thus if the cooling water is limited to a 20°F temperature rise as previously stated, it can absorb only 20 B.t.u. per pound as a liquid coolant from the engine; however, as steam in the flash chamber at 212°F, it can absorb 970 B. t. u. per pound. Obviously, there is little comparison between the relative heat absorption qualities of high and low temperature cooling processes. Higher temperatures in the range above 240° F are useful in certain processing operations of modern industry whenever higher steam temperatures are required.

From the results of recent experiments and general operating conditions, the following advantages of Vapor-Phase cooling are apparent: (1) Faster heat transfer from engine cylinders to cooling water, resulting in more complete heat recovery; (2) Decreased wear between moving engine parts; (3) Improved cylinder lubrication and decreased sludging of crank-case lubricants; (4) Prevention of gaseous condensation within the cylinder resulting in decreased cylinder liner wear; (5) Extreme simplicity involving automatic temperature control and a completely sealed cooling system; (6) Increased radiator capacities where radiators are used.

Practical Results

It has been reported that existing installations of Vapor-Phase cooling have permitted waste heat utilization in the amount of five to six pounds of low pressure steam, varying in gage pressure between five and twenty psi, per brake horsepower-hour developed, without any alteration in basic engine design. This performance approximates a 50% heat recovery of the total heat input into the engine, and when added to the regular brake thermal efficiency results in somewhat phenomenal over-all thermal efficiencies between 75% and 80%. Even where waste heat utilization is not of prime importance, Vapor-Phase cooling contributes to greater engine life through reduced sludging, faster heat transfer, and reduced wear between engine parts.

The operation of the Vapor-Phase system can best be explained by reference to an actual diesel engine installation, recently put into operation at a West Coast manufacturing plant. Besides producing all the power required for the many shop tools and machines, compressors, welding units, and other equipment, the two Caterpillar Diesel-Electric sets, through utilization of the Vapor-Phase system and waste heat boilers, produce enough steam heat to supply several plant buildings. Average over-all thermal efficiencies recorded for the unit are about 70% as compared to 31% thermal efficiency of the diesel engines alone.

Vapor-Phase is not limited strictly to stationary engine units, but is also finding use in the automotive and marine engine fields, as can be witnessed by the increasing interest displayed by the transportation industry and by the U. S. Navy. One Naval installation in particular, aboard an auxilliary vessel, utilizes a Vapor-Phase unit for four diesels, including one 350 hp Atlas propulsion engine and three auxiliaries. The arrangement permits every engine to remain at operating temperature although not actual running, thus insuring quick engine power without the customary warm-up period. In addition to this, the cooling system provides enough steam heat and hot water for the entire vessel.

The utilization of sewage gas and inferior quality oil-field gas can now be made possible through the high temperature cooling processes discussed above. No scrubbers or purifiers are needed because the engine operates at temperatures well above the dew point of the corrosive sub-

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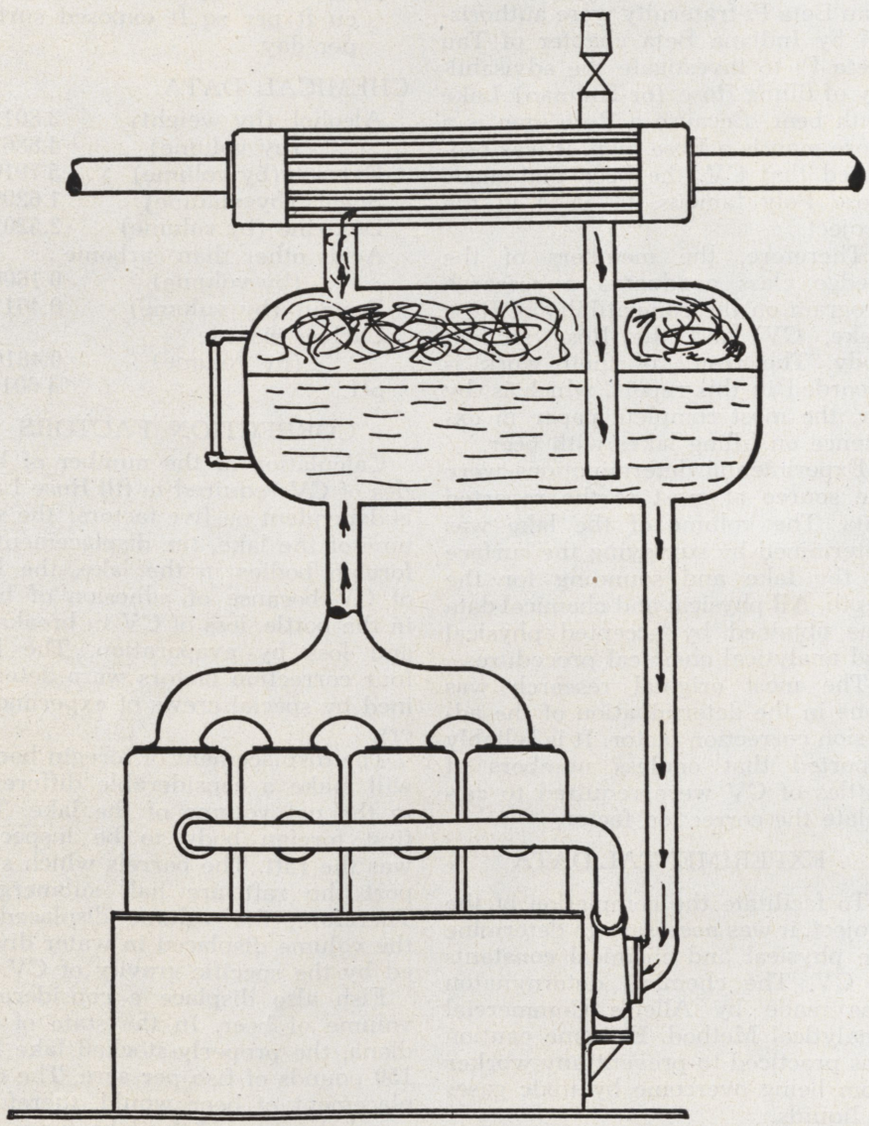

LIQUID COOLED VAPOR PHASE SYSTEM

Cut Courtesy Pacific Enterprise Products Inc.

Report of The S.P.E.A.A.*

Adapted by Fred Corban, jr., ch.e.

Because of the gravity of this report, the Rose Technic and Tau Beta Pi feel that it would be in the best interests of the public if this report were published in a magazine of wide circulation (the Technic, for example.) The consideration of the problem by every intellectual is of the utmost importance. This report may herald the beginning of a new age.

INTRODUCTION

On June 3, 1948, the pledges of Tau Beta Pi fraternity were authorized by Indiana Beta chapter of Tau Beta Pi to investigate the advisability of filling Rose (or Hulman) Lake with beer. Because a Rose man is a Rose man is a Rose man, it was proposed that CV, the beer that made Rose Poly famous, be used in the project.

Therefore, the members of the pledge class conducted a research program on the compatibilty of Rose Lake, CV, and the Rose student body. The result of their work is recorded in this report, which is, by far, the most complete paper in existence on filling lakes with beer.

Experimental determinations were the source of most of the reported data. The volume of the lake was determined by surveying the surface of the lake and sounding for the depth. All physical and chemical data was obtained by accepted physical and analytical chemical procedures.

The most original research was done in the determination of the adhesion correction factor. It is reliably reported that endless numbers of bottles of CV were required to calculate the correction factor.

EXPERIMENTAL DATA

To facilitate the completion of the project, it was necessary to determine the physical and chemical constants of CV. The chemical determinaton was made by Allen's Commercial Analytical Method. Extreme caution was practiced to prevent any worker from being overcome by toxic gases or liquids.

The following data were determined:

PHYSICAL DATA

Color: P. yellowish brown

Odor: 1.0023674 pO (pO represents the logarithm to the base 2 of odor threshold intensity or concentration.)

Taste: Bitter tang when taste buds are first exposed. Taste not judgeable after long and continuous exposure.

Specific gravity: 1.008

Rate of evaporation: 0.0083215 cu ft per sq ft exposed surface per day.

CHEMICAL DATA

Alcohol (by weight)	3.8013%
(by volume)	4.8869%
Extract (by volume)	5.7910%
Sugar (by volume)	1.6299%
Dextrine (by volume)	2.5201%
Acids other than carbonic (by volume)	0.1600%
Protein (by volume)	0.4011%
Carbon dioxide (by volume)	0.4810%
pH	4.601

CORRECTION FACTORS

Calculation of the number of bottles of CV required to fill Rose Lake is dependent on five factors: the volume of the lake, the displacement of foreign bodies in the lake, the loss of CV because of adhesion of beer in the bottle, loss of CV in breakage, and loss by evaporation. The last four correction factors were determined by special crews of experimenters.

The displacement of foregin bodies will make a considerable difference in the net volume of the lake. The first foreign body to be inspected was the raft. The barrels which support the raft are half submerged. Therefore, the volume displaced is the volume displaced in water divided by the specific gravity of CV.

Fish also displace a considerable volume of beer. In the state of Indiana, the properly-stocked lake has 150 pounds of fish per acre. The displacement of beer would, therefore, equal the area of the lake times the 150 pounds of fish per acre divided by the specific gravity of CV and the weight of water.

In Rose Lake, as in all lakes, there are large amounts of algae present. By actual measurement of the hardness of the water and the volume of a unit weight of Rose algae, the total volume of algae was calculated.

The largest displacement correction was that caused by swimmers and waders. By observation it was determined that the large majority of Rose students have endomorphic bodies with a specific gravity of 1.045. The average weight of those who would want to swim or wade in beer was estimated to be 163.5 lb. Assuming each body to be 0.93 submerged, each person would displace 2.316 cu ft.

The effect of adhesion of the beer to the bottle causes four or five drops to remain in the bottle. Therefore, a correction factor was calculated from the formula $F=wAZM$, where

F = correction factor

w = surface wetting and adhesion factor (In this case w=0.001207. Courtesy CV Manual CV-29-4, Properties of Glass used in Bottling CV, by Dr. A. J. Bottleworks, 1947.)

A = surface area of bottle interior

Z and M are empirical constants depending on temperature and atmospheric conditions.

Substituting in the equation, F was found to be 0.9994. The total number of bottle is therefore the number computed divided by 0.9994.

Loss of beer by breakage was deemed less than 0.0001% because the majority of beer from the broken bottles would seep into the lake.

The loss by evaporation was calculated from the physical constant of evaporation (see physical data), the area of the lake, and the time required for the filling of the lake. The total loss was calculated to be 11,102.67 cu ft.

The number of bottle of CV required to fill the lake is determined by the following equation which is

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*Society for the Preservation and Encouragement of Alcoholic Analysis.

Grant and Flanagan clear the way for Snyder against Principia, 1947.

Homecomings We Have Known

By Phil Brown, Athletic Director

Somehow homecoming days at colleges throughout the country centers around the football game played on the campus on the afternoon of the Big Day. Almost every college works out plans for various dinners, luncheons, dances, class reunions, and speeches ad infinitum. But in spite of attempts to add color to the week-end all interest is focused on the ball game. The aftermath discussions and memories dwell on the game more than on the banquet or dance.

Do you remember—

Homecoming in 1930? Valparaiso was the opponent. We were undefeated up to that time. The fraternity houses were all dressed up in Rose and White with football the main theme. The Sigma Nu's had an entire football field laid out in the yard—complete with little players, officials, even benches and substitutes. The day of the game was bright and very hot (so hot that the Valpo players insisted they wwere too far south for good football weather). With Joe Creedon and Joe Schach doing beautiful work on offense we squeezed out a victory 36-6.

That queer game with Evansville College in 1932? That was the game in which Rose gained almost four hundred yards and yet scored only fourteen points. The same day Notre Dame gained less than three hundred yards and scored 43 points. But some of our yards were sacrificed when Cliff Pratt ran seventy yards to the Evansville 20-yard as the first half ended. A noteworthy sidelight of the day was the decoration of the Alpha Tau fraternity house. A twelve-ton steam roller with Rose and White coloring was shown running over Evansville.

Al Klatte scores against Earlham, 1940

Do you remember the 1932 game? Union College of Kentucky provided the opposition and plenty of it. With a howling wind coming from the west, offensive moves by both teams were hampered when they headed west. In a game that was almost a toss-up we managed to pull one out of the fire, 8 to 6, when a Union College punt blew back past the kicker and out of the end zone.

Heart-break has come along with Homecoming Days, but not too often. Wasn't it 1934 when St. Joseph's blocked Jim Hufford's attempted drop kick, scooped it up and ran 90 yards for the winning touchdown? And 1947—when Principia romped over a bunch of kids who were actually trying too hard.

Just before the war knocked us out cold we expperienced our football heyday. The Homecoming in 1940, the one in 1941, and that game of near perfection in 1942 all gave us feelings of contentment. 1940: Rose 47, Earlham 0; 1941: Rose 56, Franklin 6; 1942: Rose 69, Earlham 7. Do you think the good old days were no better than the current days?

Research and Development

By Dale Carey, soph.
and George Eddy, soph..

New Precision Camera

Development of a precision camera for testing exact qualities of new lens formulas has been announced.

The new camera is used for testing all types of photographic lenses ranging from the tiny home movie type to eight-inch focal length telephoto lenses.

Absolutely rigid in construction, the camera maintains parallelism between the film plane and lens board to within five 10-thousandths of an inch, or about one-sixth the thickness of a single sheet of paper. A micrometer focusing device controls focusing to the same degree of accuracy, although the camera is equipped with both coarse and fine adjustments. A built-in microscope assists critical focusing, while a lock holds the camera in the exact focusing position selected.

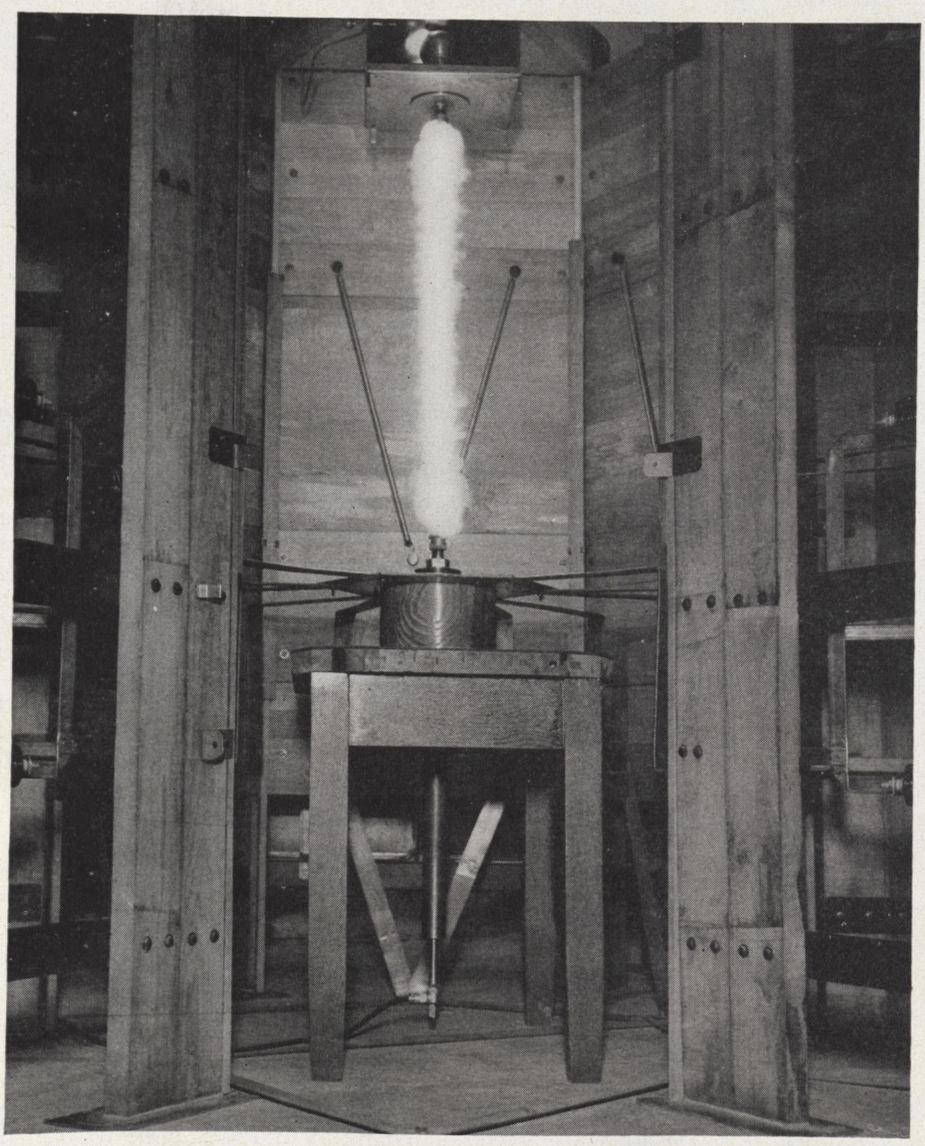
Commercial-type cameras are not sufficiently rigid to use for lens testing purposes, making it impossible to determine whether existing errors are the fault of the lens or camera. The new camera, however, affords a positive check, the designers point out.

Negatives of photos taken with the camera may be quickly compared with test charts to measure resolving power, curvature of field, astigmatism and distortion.

The camera can accomodate photographic plates ranging up to five by seven inches. Designed for testing lenses with focal lengths from one-half inch to eight inches, it is equipped with both focal plane and between-the-lens shutters, the latter being used for very short focal length lenses.

Only slightly larger than a commercial five by seven camera, it weighs about 40 pounds. The camera is portable, or may be mounted on a conventional heavy duty tripod. Mechanical parts are made of aluminum castings, except for the slides, which are stainless steel.

While designed principally for testing new lens designs, the camera may also be used for very precise photographic and copy work.



Cut Courtesy National Bureau of Standards

Measuring a 100,000-ampere current surge.

Current Surge Measurement

A 100,000-ampere current surge is measured during discharge by means of a coaxial tubular shunt (beneath the table) recently developed for this purpose at the National Bureau of Standards. The voltage drop across the shunt, which forms part of the discharge circuit, is applied to a high-speed cathode-ray oscillograph by means of potentia terminals brought out as a coaxial cable at the lower end of the shunt. The current magnitude is then determined from the characteristics of the voltage drop as recorded on the oscillograph.

New Fifth Dimension Invented

A five-dimensional world, in which space and time have been broken up into chunks so small that they cannot be divided any further, has been invented by a foreign mathematician.

This new geometry adds a new "uncertainty dimension" to length, breadth, thickness and time. It is described as necessary to take account of that paradoxical offspring of quantum mechanics, the "uncertain-

Concluded On Page 28

Campus Survey

By James Morris, jr., c.e.

Rosie Goes To Town

The town of Terre Haute was literally thrown into a state of confusion on the evening of last August 20, when the student body of Rose Tech brought their school mascot, Rosie, into town to make her annual debut. The "Rambling Wrecks from Old Rose Tech" engineered their way into the fair city and were successful in halting all traffic for a full half hour or more, while the Freshmen "Green Caps" performed various acts of allegiance to their beloved mascot.

For some weeks prior to this traditional event, the Green Caps had been busily engaged in preparing Rosie for her long-awaited journey. With Jim (Mouse) Sherman and his staff of interior decorators performing the needed repairs, the job of redecorating the four-legged monster was completed in less time than no time.

Having decided upon August 20 as D-Day, at approximately seven and one half bells the student body collected in front of the school and prepared to invade the city. Due to the fact that certain members of the student body are cross-eyed, while others have defective eyesight, the procession occupied three of the four lanes of traffic on the highway. Under the able leadership of Commander in Chief, Paul (Lover Boy) Wible, who led the procession with Rosie in tow, the city limits were soon reached.

At the corner of Seventh and Wabash Avenues, our two motorcycle escorts, Red Hart and Jerry Miller, halted all traffic while Rosie was placed in the center of the intersection. The Green Caps then proceeded to roll up their pant legs, exposing their manly muscles, while the female spectators watched in horrified amazement. Following explicit instructions from the upperclassmen, the Freshmen then performed various sacred rituals in honor of Rosie. As a final tribute to their mascot, the Green Caps then blended their golden voices in a marvelous rendition of Dear Old Rosie — Amen. A few lucky girls were then induced to sign Rosie, after which the procession moved on.

After several more stops at various intersections, the local police put in their appearance and it was quickly decided that Rosie's bedtime had arrived. Fearing that the little men in blue might lose their patience, Mr. 6.9 (Art Lusty) jumped behind the wheel of Rosie and drove off in all directions.

Thus another journey was successfully completed and the evening's activities came to an end. Our only regret is that our dear friend, Brother Owen, did not seem to enjoy our little parade. The next time he comes to our fair city, perhaps we should drop in and pay him our respects??

Football Season Begins

In the shadows of the nearly completed field house of Rose, the "Fighting Engineers" are preparing for another gridiron season. At this time it is too early to make any wild predictions concerning the team, but coach Brown has announced the following schedule of games:

Sept. 25—McKendree at Lebanon, Illinois
Oct. 2—Canterbury at Danville, Indiana
Oct. 9—Franklin
Oct. 16—at Hanover
Oct. 23—open
Nov. 6—Cedarville
Nov. 13—Indiana Central

Reorganization of Clubs

With the coming of fall, the political fervor of the school mounted and resulted in the holding of several elections. After the smoke of battle had cleared away and the campaigning was over the school took cognizance of several new leaders.

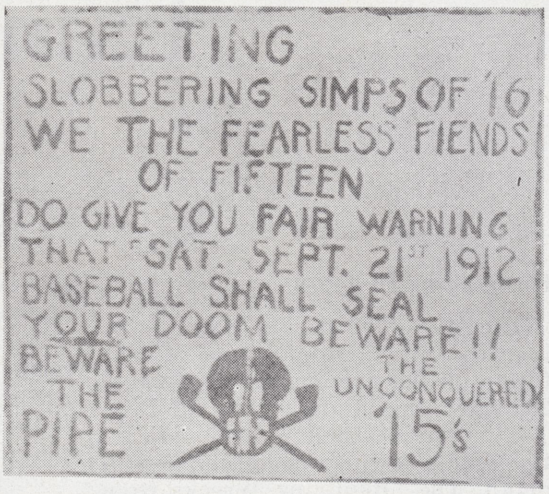
The highly inactive debate club began showing signs of life, and at a large organizational meeting, the following officers were elected: Fred Corban, President; Bob Schwier, Vice President; and Bill Orbaugh, Sec. and Treas. of the Club. The club has as

Concluded On Page 30

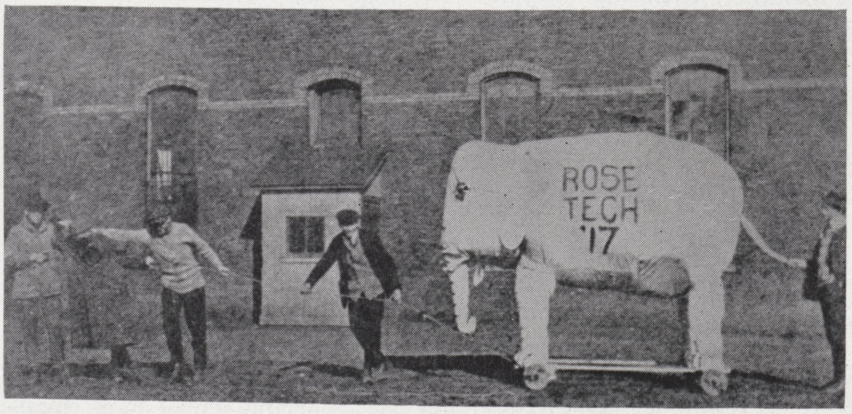
Assorted small cogs.

Retribution sets in; moral: "Green Caps" should be seen.

Old Timers

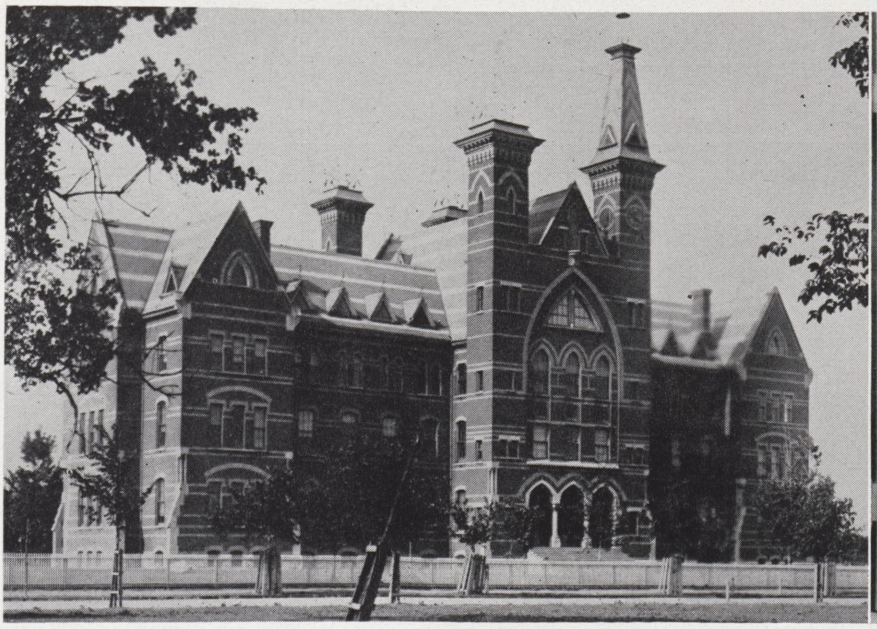


Scares us.



Queen Rosie I.

Page



There was a school . . .

When Men Were Men.

FRIDAY

6:30 P.M. Class of '03 reunion dinner at the Terre Haute House

7:00 P.M. Rosie Goes To Town

See the old Rose spirit in action

7:00 P.M. Judging of the Fraternity houses.

8:00 P.M. Bonfire on the Campus.

Cider and doughnuts

8:30 P.M. Meet the football team in front of the field house.

Snappy patter and clever sayings by Phil Brown

9:00 P.M. Fraternity Open Houses

For a rousing good time

SATURDAY

10:00 A.M. Annual Alumni meeting.

12:00 M. Luncheon at the Dormitory.

2:00 P.M. Rose vs. Earlham.

Back the team

4:00 P.M. Alumni Open House
6:00 P.M. Alumni Banquet
6:00 P.M. Ladies Dinner.

At The Terre Haute House

9:00 P.M. Homecoming Dance at the Armory.

Trophy for the best decorated fraternity house awarded during the intermission

---

ALUMNS! for an extra dividend of enjoyment read Fraternity Notes and attend your fraternities open house.

Alumni News

By Edward Meagher, sr., ch.e..
and Mort Hief, soph.

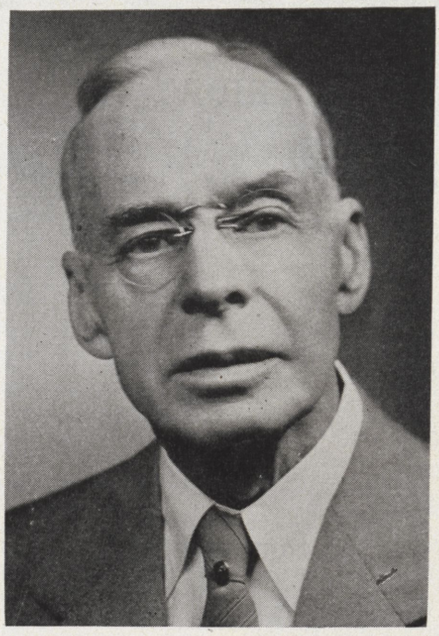
ARTHUR D. KIDDER

Mr. Arthur D. Kidder, formerly of Terre Haute, and a graduate of Rose in 1899, was recently awarded a gold medal by Secretary of the Interior, J. A. Krug, for distinguished service. He first joined the government service in 1900, retiring last year in July. His special work was the surveying of public lands and boundaries, and the investigation of the titles where there were questions between the government and adverse interests.

Up to 1910 Mr. Kidder's work comprised such surveys, but later there developed a need for clearing titles in the older public land states in which he had an important and responsible part. He took part in the opening of the Kiowa and Comanche Indian reservation in the Oklahoma territory, including the completion of the surveys in that area and the laying out of three government town sites. His ability as a mathematician is demonstrated by the calculation and compilation of the mathematical tables and formulas included in the Standard Field Tables and Trigonometric Formulas prepared by the General Land Office for the use of its general staff in 1910.

One notable public service was in connection with the boundary dispute between Texas and Oklahoma which involved claims to vast oil lands within the bed of Red River. Mr. Kidder prepared the many exhibits and surveys of the government's case, and served as one of the two commissioners who were to locate the boundary subsequent to the decision of the United States Supreme Court.

Mr. Kidder is the son of the late Willard Kidder, proprietor of the Wabash Flour Mills, who was one of the owners of the Terre Haute street car lines. He has four brothers who are engineers, and two sisters. Mr. Kidder married Miss Fidelia Royse of Terre Haute, a graduate of Indiana State Teachers College of the class of 1899. They have one son, Arthur R. Kidder, who is a pilot with United Air Lines. He is a graduate of the Boeing School of Aviation, class of 1934.



Arthur D. Kidder

Mr. Kidder graduated at Rose in civil engineering and received a Master's Degree in Astronomy at George Washington University in 1901. Outstanding in World War II were his precise astronomical determinations to meet the needs of the Armed Forces, including essential data on 28 stars to permit rapid calculations of azimuth in the field for use in gunfire.

Mr. Kidder since his retirement has gratified a life-long ambition to return to his old home in Terre Haute, where he now makes his headquarters and where he has maintained an apartment in the Wabash Apartment on South Sixth Street for many years. At present he is serving as commissioner for the Supreme Court of the United States on the case involving the boundary line between the states of Colorado and New Mexico, and has spent most of the summer on this survey.

Mr. Kidder is now the senior partner in the newly organized firm of Kidder and Thoma, Cadastral Engineers, which will engage in large scale surveys, boundary locations, riparian rights and preparation for trial of suits.

W. H. JUNKER

Mr. W. H. Junker of Cincinnati, Ohio, was graduated from Rose in 1921 with a bachelor's degree in mechanical engineering. Upon graduation he entered the employment of Harry Hake, Architect, as the chief mechanical engineer. Later he worked for Emery Industries, Inc., starting out as plant engineer and later becoming director of engineering and then works manager. He now serves as a consulting engineer. His most interesting job was the design of mechanical equipment for four million telephone buildings.

Mr. Junker married Miss Ann M. Tyler in 1927. He has two children, Allan, who is now a student at Rose, and Janet. Along engineering lines Mr. Junker's favorite hobby is building models of construction projects. Other hobbies are fishing and mint juleps.

When asked if he would advise a young man to study engineering, Mr. Junker said yes, and if he had it to do over, he would take engineering again at Rose.

Mr. Junker is listed in Who's Who in Engineering and Who's Who in Ohio, and is a member of the ASME, ASHVE, and a past director of the Cincinnati Engineer's Society. He has served as president of the Louisville and Cincinnati Rose Clubs, and as president of the Louisville and Cincinnati Theta Xi Alumni Clubs. He is also a past vise president of the R. P. I. Alumni Association.

According to Mr. Junker, the prime requisites of a "successful life" are to "Work like hell and try to retire at 50—take it easy in Florida after 50."

'26 Ralph W. Tapy was a recent visitor to the campus. He is now head of the electrical engineering department at the University of New Mexico in Albuquerque.

'37 Lt. Col. Harry J. Halberstadt, Eighth Air Force plans and requirements officers, has been selected to attend the Air Force College of Industrial and Engineering Administration at

Concluded On Page 32

Newsworthy Notes for Engineers

Red Light stops trouble-makers

This girl is using a test set designed by Western Electric engineers to detect defective fuses which would pass ordinary tests. X-ray studies of bad fuses showed broken fuse wire as the usual cause of failure, but that 90% of the time, the broken ends made sufficient contact to test O.K. unless the fuse was vibrated. In the new test set, the fuse is struck ten times a second with a force of 250 grams causing the broken ends to separate—an "open" for as little as ten micro seconds, lights a red light—and the fuse gets no chance to make trouble in telephone service.

Bumper crop of crystals grown from seed

Here you see a tank-full of synthetic EDT (ethylene diamine tartrate) crystals ready for harvesting at Western Electric's Electronics Shop. These have been held at a fairly constant temperature for several weeks and have swished back and forth in the solution in the tank, growing from tiny seeds into chunks the size of your fist. They will now be processed into crystal plates to filter various voice channels—nearly 500 separate conversations—traveling over the same long distance telephone circuit. Setting up equipment and working out precise controls required in growing crystals was an interesting problem for Western Electric engineers. This year's crop will produce a million or more crystal plates.

Engineering problems *are many and varied at Western Electric, where manufacturing telephone and radio apparatus for the Bell System is the primary job. Engineers of many kinds—electrical, mechanical, industrial, chemical, metallurgical—are constantly working to devise and improve machines and processes for mass production of highest quality communications equipment.*

Western Electric

A UNIT OF THE BELL SYSTEM SINCE 1882

Fraternity Notes

Alpha Tau Omega

The night of August 29 found the actives, pledges, and guests of the chapter busily engaged in the old familiar pastime of elbow-bending and chin-wiggling. The locale for this activity was well chosen, for we were along the banks of the Wabash at the summer cottage of Brother Bob Jenkins. The occasion for this gathering was the summer stag party. Various types of revelry were indulged in that evening: poker games, bull sessions galore, plenty of singing, and then just plain revelry. We would like to take this opportunity to thank Brother Jenkins for the use of the cottage, and to commend our new social chairman, Bill Orbaugh, for his fine work in planning and organizing this gala affair.

On Sunday, September 12, initiation ceremonies were held in order to activate our pledges. To impress more firmly upon their minds the solemnity of the occasion, a period of enlightenment prior to the initiation ceremonies was held. The following new activities were warmly welcomed into our midst: Hugh Hanna, Bob McAllister, George Eddy, Bob Pollock, Bob Ricketts, Roger Peck, and George Bankoff.

To you alumni that would like to be let in on the big scoop about homecoming, the following is proferred. After the bonfire on the Friday of homecoming, the chapter has arranged a stag party at the house. We are expecting a good turnout of alumns this year, so drop around and see us after the bonfire.

We are glad to have with us again our Province Chief, Jake Maehling, who has been conducting tours in Europe. Another greeting of welcome home must go to Brother Roger Peck. He's been serving a tour of duty in the Army for the past eighteen months.

Brother Sid Zeid has gone off the deep end recently by putting out his pin. The fair young damsel: Miss Winifred Neal of Terre Haute. Congratulations are also in order for alumnus Joe Neill, who was married to Miss Joan Adamson of Terre Haute.

Lambda Chi Alpha

These changes were completed before the rush parties on August 28th and 29th. On August 30th the following men were formally pledged to the fraternity: Bill Atto, Wayne Barker, Charles Crews, Hubert Evinger, Jim Ellington, Fred Garry, Jack Gladden, Gordon Fowler, Dick McLaughlin, and Ernie Weddle.

Afterwards, the regular pledge banquet was given at "Louises" with everyone doing justice to the spaghetti and chicken. In addition to the actives and pledges, Dr. Knudsen and Mr. Hansell were present and they consented to give some after-dinner remarks. Also, the seniors who will not be present at the next pledge banquet gave short talks on their fraternity experiences.

The fraternity extended the hand of brotherhood to Mark Hunt and Bill Tilton at a formal initiation ceremony held the evening of September 10th. Brother Don Stolzy officiated as ritualist.

The fraternity made its annual jaunt to Shakamak on August 22nd. There was plenty of food and no rain, so a good time was had by all. A number of very enjoyable informal open houses have been held recently in line with the increased social activities program.

During the past month, the members have seen several of their alumni brothers, namely Don Spencer, Warren Haverkamp, Bob Bannister, and Midshipman Bill Sharpe. Some of the members also made the acquaintance of Mr. Applehans when he had dinner at the house recently. Mr. Applehans is a Three-I League official and an alumnus of our chapter at the University of Illinois.

The chapter is looking forward to seeing many of the Lambda Chi alumni at homecoming. In addition to all of the regular activities being planned by the school, the fraternity is making plans for a dinner before the bonfire and an open house afterwards.

Theta Xi

In concluding a very successful rush, the following men were pledged at a formal ceremony on Monday, August 30: Thomas Albright, Hamilton, Ohio; Augustus R. Arpante, Pittsfield, Mass.; Robert E. Carden, Chicago, Ill.; William G. Cummings, Louisville, Ky.; Joseph W. Grenda, Bridgeport, Conn.; Myron D. Hawk, Pontiac, Ill.; Clifford E. Hennig, Chicago, Ill.; Stewart Herring, Jr., Ft. Wayne, Ind.; Roy W. James, Clinton, Ind.; Nicholas R. Michaels, Buffalo, N. Y.; Clark S. Miller, Columbus, Ohio; George H. Miller, Olney, Ill.; Jack E. Oberle, Sturgis, Mich.; Robert G. Rinker, Terre Haute, Ind.; James H. Sherman, New Castle, Ind.; David A. Smith, New Castle, Ind.; Robert G. Stater, Connersville, Ind.; Leonard T. Stricker, Indianapolis, Ind.; and Dale Scott, Indianapolis, Indiana. Following the pledging ceremony, the fraternity as a body attended a movie. Since Indiana State was not in session at this time, the usual serenade to the Women's Residence Hall was sung at various points along the way.

The regional conference was held this year at Purdue on the week-end of September 24-26. Chapters attending this conference were those from Purdue University, University of Michigan, Ohio State University, Indiana University, and Rose Polytechnic Institute.

At this time plans are being made for Homecoming activities. The Kappa Alumni Banquet will be held at the Fort Harrison Boat Club on Friday, October 29. Later in the evening, following Rosie's trip to town, a stag party will be held at the chapter house. Saturday afternoon following the football game, open house will be held and a buffet luncheon served. The celebration will be highlighted by the Homecoming Dance on Saturday night at the Armory. Kappa is looking forward to being hosts for a large number of the returning alumni.

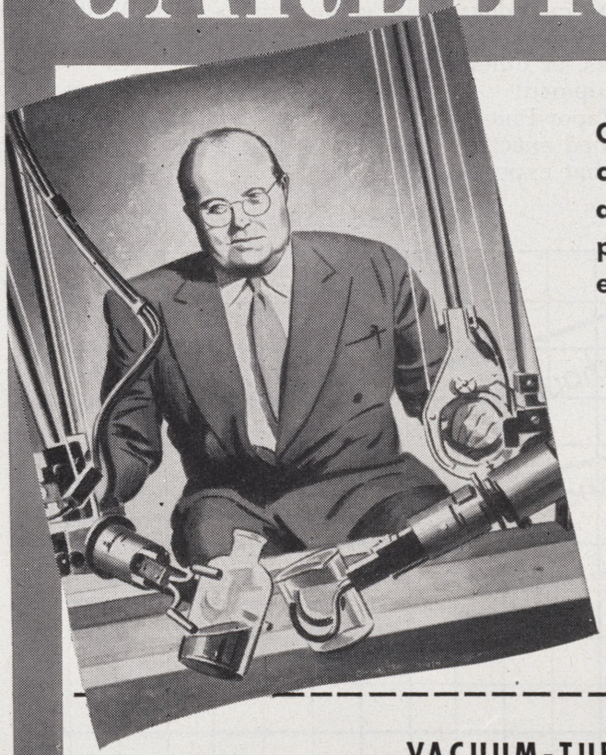
Sigma Nu

Beta Upsilon of Sigma Nu is proud to announce the pledging of twenty men on the night of August 30th, following a banquet held at the Boat Club. The men pledged by Sigma Nu were as follows: Nicholas Puzel, Jack Bailey, Robert Dean, Gordon Huntington, Harry Johnson, Arthur Lusty, Kenneth House, Richard Myers, Eugene Burris, William Kallansrude, Robert Kriz, Robert Bohrman, Alfred Beier, William Patton, Harry Plew, Donald Moore, Jack Marshall, Howard Jessup, Robert Kahl and Ervan Meise.

Keith Taylor and Denzil Hammond were the chapter's delegates to the Sigma Nu National Convention, held in the Huntington Hotel, Pasadena, California, August 29th to September 7th.

Bob Hutchinson did the honors on cigars, pinning Miss Barbara DeNeut of Indianapolis.

CAREERS AT GENERAL ELECTRIC



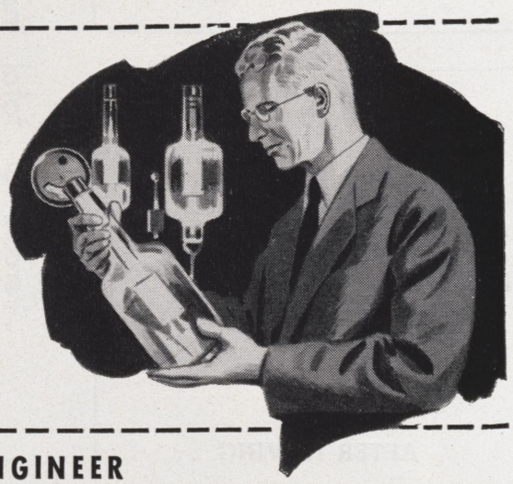
General Electric is not one business, but an organization of many businesses, offering opportunities in virtually all the professions. Here three G-E men brief the career-possibilities which the company offers to the mechanisms expert, the vacuum-tube specialist, and the engineer.

MECHANISMS EXPERT

John Payne (Cornell), who developed the mechanical hands for atomic research: Radioactive isotopes create problems to delight the heart and fire the imagination of any mechanical or electrical engineer who has a bent toward mechanisms. Developing pile "service" mechanisms and manipulating devices like the remote-control hands is tied in with a lot of existing techniques, but the special conditions offer a real challenge—and a real opportunity—to the engineer.

VACUUM-TUBE SPECIALIST

Dr. Albert W. Hull (Yale), assistant director of the Research Laboratory: The use of vacuum tubes for controlling industrial processes is only beginning. A new tube with a "dispenser cathode," for example, can take signals from "electrical brains" and apply them to apparatus of any desired size . . . Also, a new thyratron gives mastery over high-voltage currents as high as 40 amps at 70,000 volts. Such developments will foster the use of vacuum tubes as engineering tools and electronic servants.



STUDENT ENGINEER

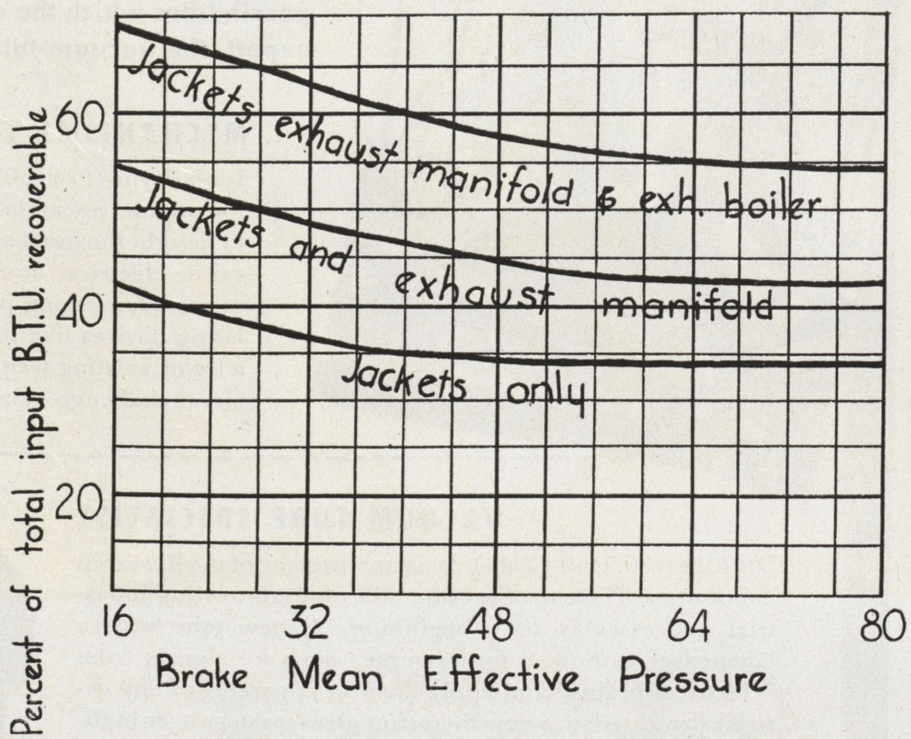
Bob Charlton (Texas), graduate of the G-E Advanced Engineering Program: I have just completed three years of intensive engineering study on a level with the best graduate schools. Besides my experience "on the job," I've studied 20 hours at home each week. The first-, second-, and third-year courses are tough and realistic—the problems actually come from engineering divisions. I don't know of a better way to get a thorough technical background for an engineering career in industry.

For further information about a BUSINESS CAREER with General Electric, write Business Training Course, Schenectady, N. Y.—a career in TECHNICAL FIELDS, write Technical Personnel Division, Schenectady, N. Y.

GENERAL ELECTRIC

stances contained. Therefore, all harmful compounds are carried away with the exhaust gases instead of being deposited within the cylinder. In addition, the heat recovered may be used in sludge digestors, or other petroleum processing equipment.

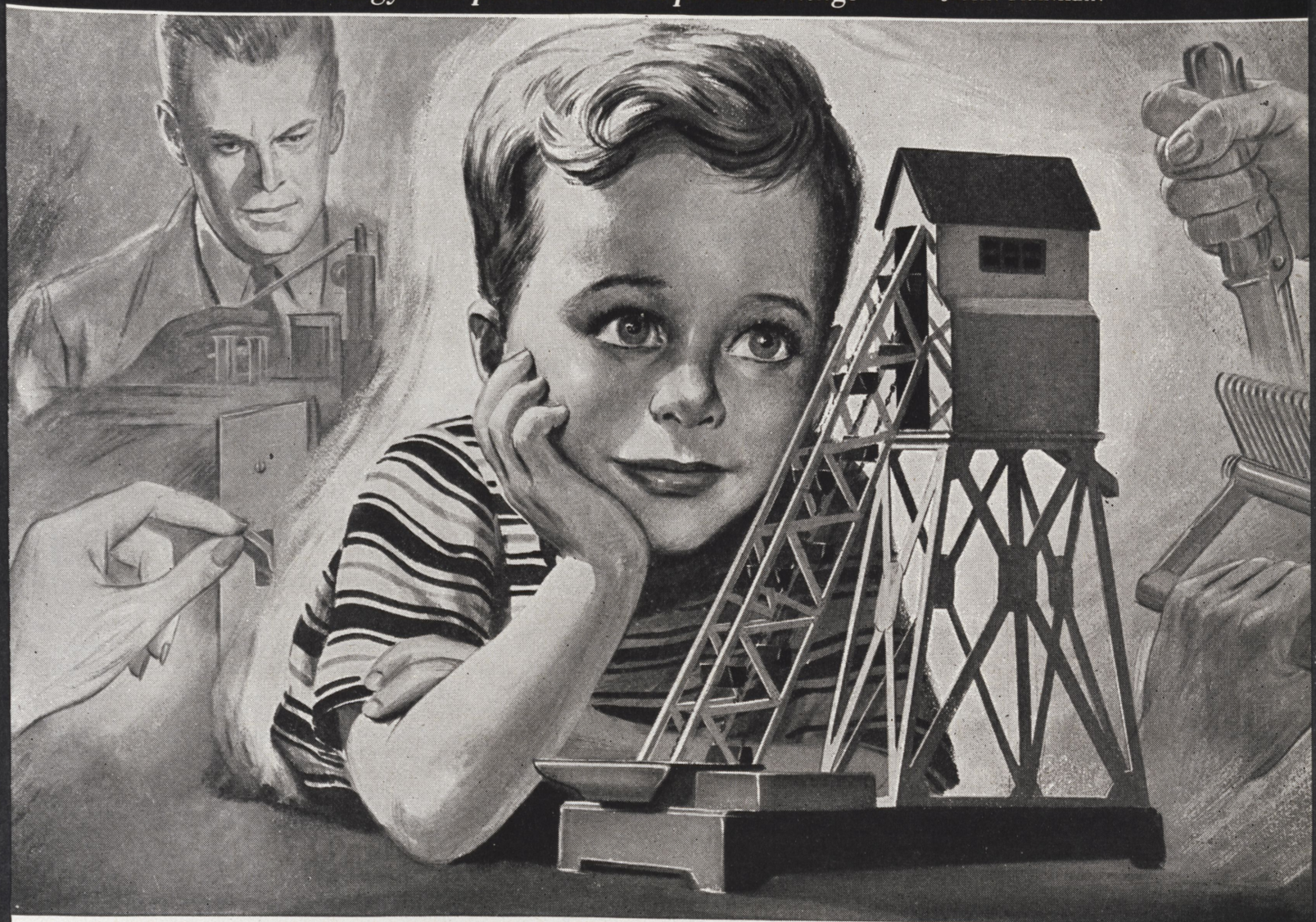
The true value of the Vapor-Phase system cannot be determined exactly because of its still somewhat experimental operation. However, with increased fields of application opening to it, the Vapor-Phase system may soon come into its own. At the present time, it successfully performs two functions: firstly, it insures smoother engine performance and longer engine life, and secondly, it provides excellent means for waste heat recovery.



Cut Courtesy Diesel Power

Estimated heat recoveries possible with the Vapor-Phase System.

"Energy and persistence conquer all things"— BENJAMIN FRANKLIN



Why power now serves us better

When it comes to *power*, the dreams of our childhood are fast becoming a reality. For no matter what our needs, special motors or engines are now designed to meet them.

From the tiny thumb-sized motors in electric razors—and the surge of the engines in our cars—to the pulsing turbines that propel our ocean liners . . . today's power is better, more dependable than ever before. And these advances were brought about by research and engineering . . . and by today's *better materials.*

Examples? Better metals for giant turbines and generators, improved transformers and transmission lines. Stainless steel, resistant to rust and corrosion. Better plastics that make insulation fire-resistant, and more flexible and wearproof . . . for the millions of miles of wires it takes to make power our servant.

There is a promise, too, of even greater, more concentrated power. *Atomic* power harnessed for industry and the home . . . approaching man's dreams for the future through research and engineering. This also takes such materials as carbon . . . from which the all-important graphite, used to "control" the splitting atom, is made.

The people of Union Carbide produce materials that help science and industry improve the sources and uses of power . . . to help maintain American leadership in meeting the needs of mankind.

FREE: *You are invited to send for the new illustrated booklet, "Products and Processes," which shows how science and industry use UCC's Alloys, Chemicals, Carbons, Gases and Plastics.*

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Continued From Page 12

a summation of all the correction factors.

$$N_{cv} = \left[\left[V_{gross} - \left[\frac{6\pi(24)^2 36}{2\times4\times1728\times1.008}\right] - \left[\frac{150\times3.180}{62.4\times1.008}\right]^{.31}\right]^{K} - \left[\frac{1.384\times3.180\times0.48}{4.66\times10^{-5}\times1.008^{1/K}}\right]^{\frac{1}{K}}\right] - \left[\frac{0.93\times163.5-(bn^{4/2})-3}{N_{cv}\times0.958\times3.14159468}\right]^{K-1} - \left[\frac{\sum rQ}{\sum \frac{x}{2\cdot4\cdot6\cdots(2n-2)\int_0^{\pi} Pn\, x\frac{d}{dx}(1-x^2)}}\right]^{\frac{1}{K-1}}$$

where

Ncv = Number of bottles of CV

Vgross = Gross volume of the lake

K = Index of moral character of workers (For I. S. T. C. students, take 1.00035298763 as an approximate value.)

b = Mean temperature

r = Radius of CV bottleneck

Q = Quantity of CV poured per second

x = Height of surface above sea level

P = Barometric pressure

n = Experimental constant to be determined under actual conditions

This equation can be used anywhere one wishes to fill a lake with CV.

TOTAL COST

The total cost includes the cost of the beer, labor, equipment, and insurance.

Beer:

From the general equation it was found that 84,072,688.37275 bottles of CV would be required. The lowest estimate for CV with delivery to site and pick-up of empties is $2.25 per case or 9.37c per bottle.

Labor:

It was estimated that 2000 men would do the job most satisfactorily, 1000 pouring and 1000 opening bottles and handing them to the pourers. The cheapest labor available is I. S. T. C. students at $2.50 per 8-hour day. By working three shifts per day the task could be accomplished in 3.75 days.

Equipment:

Allowing for breakage, ten gross of bottle openers would be necessary. These openers are available at $12 per gross.

To remove bottle caps dump trucks of two-yards capacity will be used. There will be 173.3 truck loads at $3 per load.

Insurance:

Any project as costly as filling a lake must be insured. Lloyds of London will insure the project against rain diluting the beer, a pourer cutting himself on a broken beer bottle, a strike of workers, trucks accidentally rolling into the lake, and other difficulties for $6,000.

Total cost:

The total cost of the project has been calculated to be $7,837,253.57.

RESULTS OF FILLING THE LAKE WITH CV

The effect of filling Rose Lake with

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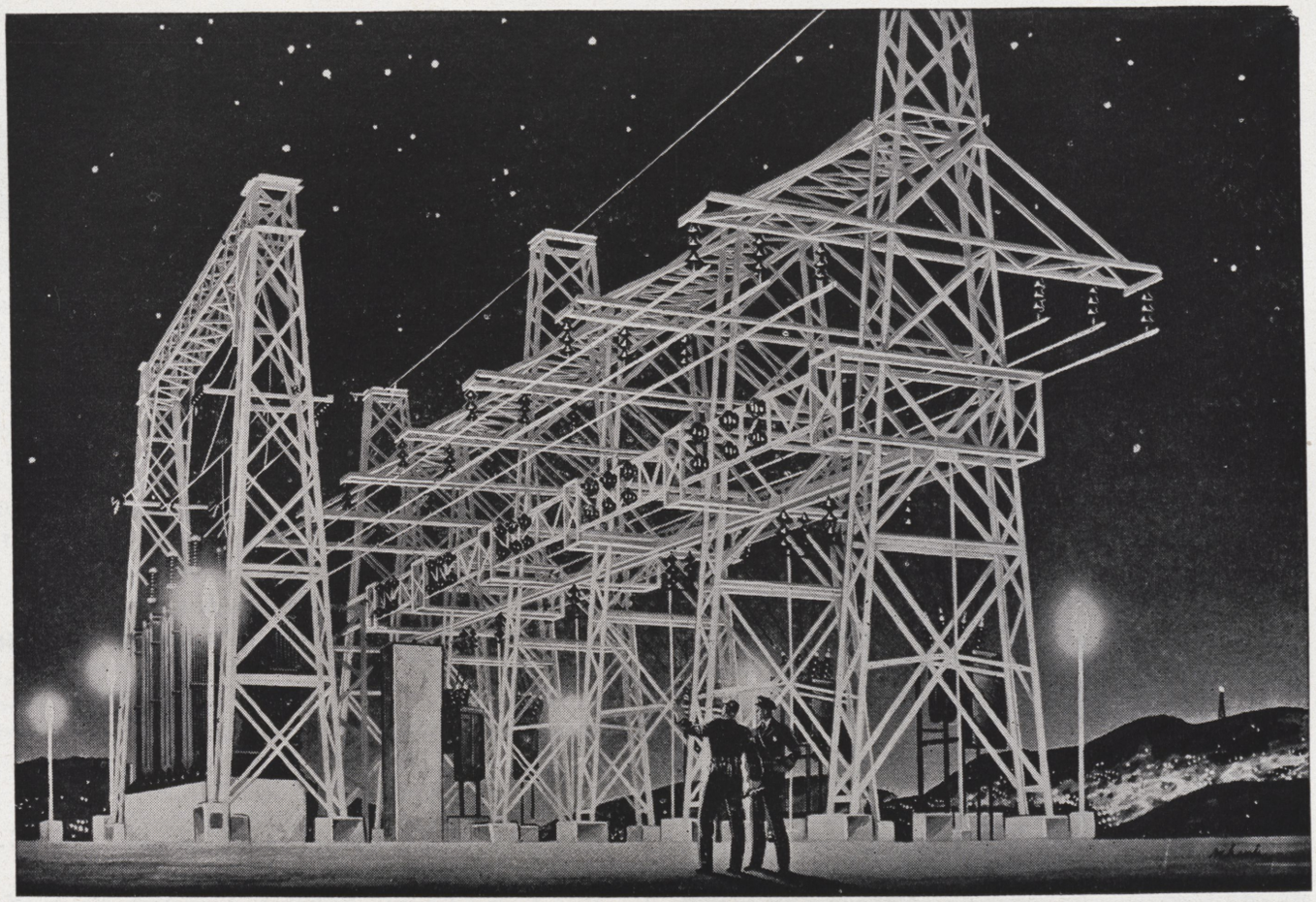


The skeleton where Volts are Housebroken

. . . with the help of
Alcoa Aluminum Structural Shapes

Electricity is transmitted in raging, sizzling, high-tension currents that couldn't be allowed to enter a home or factory. To "housebreak" this hot stuff—step it down toward a useful 110 or 220-volt distribution stature—is the job of substations.

The "skeleton" of each substation—the framework of beams and girders that support the transformers and equipment—is prey to weather, corrosive atmosphere, clinging dirt. Good maintenance has always called for frequent painting, and that called for shutdowns of electricity . . . until substation builders heard about Alcoa Aluminum Structural Shapes! Now the skeleton of a substation can be built, and routine maintenance painting forgotten. Among the standard shapes made by Alcoa, engineers find sections exactly suited to their needs.

It gives a whole new concept to structures—this building with Alcoa Aluminum Shapes. When they are used for bridges, railroad enginehouses, industrial equipment and similar structures, damaging red rust will never be a menace, painters will be freed from their frequent rounds! That's something to remember when you start putting your degree to work and are designing structures for industry instead of for grades. ALUMINUM COMPANY OF AMERICA, Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA FIRST IN ALUMINUM

ALCOA ALUMINUM 1888 1948 60 YEARS OF SERVICE

60 years ago aluminum was a novelty metal, used only for trinkets such as combs, watch fobs and napkin rings. Then along came a little company with two ideas firmly in mind—making aluminum *cheaper* and *better* so it could be more useful. That was the start of Alcoa, the start toward making aluminum so strong that it can often replace structural steel. Alcoa's 60 years of research and engineering development have swelled the uses of aluminum from a handful of trinkets to 4,000 different applications in industry, in homes, and on farms.

S. P. E. A. A. . . .

Concluded From Page 24

CV on several aspects of life must be considered before the project is approved. First, the effect on marine life will be discussed.

Fish, the most abundant marine life in Rose Lake, could not long endure in a beer medium. Beer does not contain the dissolved oxygen the fish need to live. Also, the carbonic acid in beer seriously affect the sensitive throat tissue of the fish. Because beer is alcoholic, it is by its very nature poisonous in large quantities. The death of most fish is instantaneous; however, certain fish, notably the molluscoida and echinodermis brachiopodia, have very high resistances and can live a short time in beer. The coelenterata and actinozoa varieties would perish immediately in a drunken stupor. Recent experiments have shown that the cause of death is a severe drunken condition of ifeelsohighsis. The fish were apparently very happy in the face of death.

Turtles and snakes, which make up the remainder of marine life in Rose Lake, do not care for the taste of CV according to experimentation. The total effect on marine life by filling the lake with CV would be the removal of all marine life from the area.

The effect on the student body would not be as disastrous as that on the marine life. The average student's resistance to the toxic effects of CV is quite high from long exposure. The moral effects are, in fact, more important than the physical effects in the case of the student body.

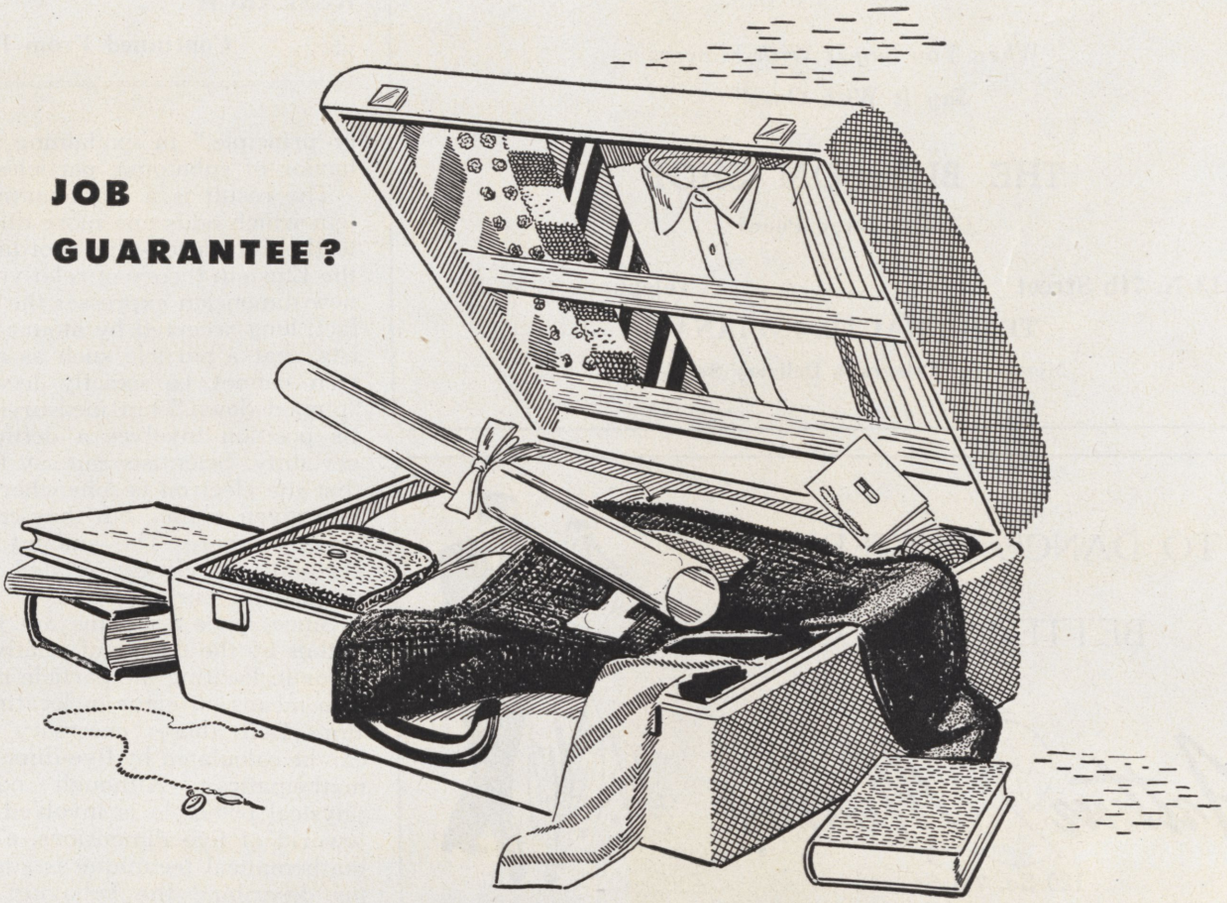
If the lake were filled with CV, the general scholarship of the student body would improve. Students would have more study time because there would be no lost time traveling to and from town for an evening's enjoyment. Students who do not live on campus would not have to return to town during school hours to visit the Rustic.

Filling the lake with CV would also increase the number of social functions on campus. Fraternity parties could be held within sight of the dear old ALMA MATER. School spirit would be greatly improved by such parties.

Although the foregoing reasons seem sufficient to demonstrate the wisdom of filling Rose Lake with CV, the task must be undertaken if only out of loyalty to that grand old man. Think what a boon it would be to him to be able to go to the lake after a hard day of teaching and refresh his weary soul. Imagine him after a warm day in his garden going joyfully forth to Rose Lake to partake his fill. The loyal men of Rose should rally to the task of filling Rose Lake with CV for their grand old friend, Dr. C. P. (Chemically Pure) Sousley.

Editor's Note:

The Technic is grateful for the privilege of presenting these little known facts to the world and congratulates the Tau Beta Pi pledges on their success in the face of overwhelming obstacles.



A college degree is the best job guarantee we know—and the best start toward a successful business career. You can be proud of your diploma, the education it stands for and what that education is going to mean to you.

Much of that education undoubtedly came from textbooks published by McGraw-Hill. They have helped you to understand the problems of the classroom. When you get into business, you should add the McGraw-Hill magazine devoted to your field to the McGraw-Hill books you will continue to use. It is the best way we know to help you keep abreast of the news and the new developments and methods you will need to know to get ahead.

In whatever branch of engineering you plan to enter—civil or chemical, mining or metallurgical—there are authoritative McGraw-Hill books. And when you're finally on that payroll, read the McGraw-Hill magazine devoted to your industry. Like your diploma, it can help you turn a job into a successful career.

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RESEARCH . . .

Continued From Page 14

ty principle," in explaining the behavior of subatomic particles.

The result is a mathematical system which adds one more dimension to the four space-time coordinates of the Einstein theory of relativity. This new dimension expresses the strange fact, long accepted by atomic physicists, that a particle such as an electron cannot be exactly located or "pinned down," but measurement of its position involves a definite uncertainty. Scientists can say for sure that the electron is somewhere within a given region, but they can't say exactly where. The amount of uncertainty is closely related to the mass of the particle.

Since space and time are tied together by the theory of relativity, an error in locating the particle in space also means an error in locating it in time. Both these "necessary errors" can be calculated by five-dimensional mathematics. Although no new physical principle is involved in the wworld of five dimensions, a neater mathematical technique is suggested for describing the behavior of the smallest particles in the universe.

DU PONT Digest

For Students of Science and Engineering

From tire cords to football pants

Do you know about nylon's other lives?

Here's a surprise for those who think of nylon mainly in terms of stockings and lingerie.

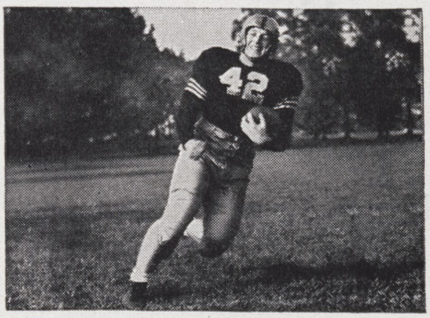
Nowadays, nylon fibers — twice as strong and half as heavy as the same size aluminum wire — are doing a variety of jobs, better than any previously known fiber. Off Labrador, men are harpooning whales with nylon lines. In a New England textile mill, abrasion-resistant nylon ropes now drive big "mule spinners" for periods ten times as long as other commercial materials, without a breakdown. Nylon fabrics are being used in everything from rugged automobile seat covers to delicately woven filter cloths.

In its plastic form, nylon is used to make everything from unbreakable dishes to hypodermic needles. As a monofilament, it goes into a variety of products from brush bristles to surgical sutures.

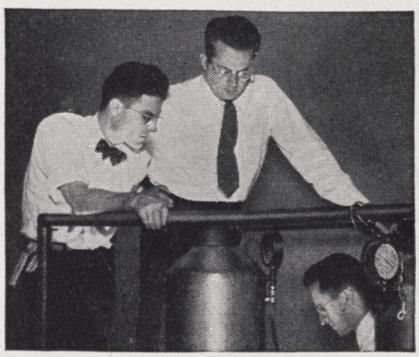
Nylon owes its origin to a Du Pont fundamental research project begun in 1928. A group of scientists set out to find out how and why the molecules of certain substances polymerized to form giant chainlike molecules. Hope of obtaining a new commercial fiber was first aroused when, two years later, a polymer was developed which could be drawn out into a thin strand, like taffy candy. The complex problems which followed called for the services of over 200 Du Pont men and women, among whom were some of America's most competent scientists and engineers.

Nylon cords *give giant truck and airplane tires the strength and elasticity to absorb tremendous impact shock without bruising.*

Water won't hurt the nylon strings *of this racquet. They resist breakage over an extended period of time. No tiny strands to fray.*



Nylon football uniforms, *as worn by Bobby Jack Stuart, Army back, are not only tough wearing, but much lighter and quicker drying.*



Nylon research: *O. C. Wetmore, Ph. D. Phys: Ch., New York U. '44; D. A. Smith, B. S. Mech. Eng., Purdue '40; C. O. King, Sc. D.-Ch. E., Mich. '43, charging experimental condensation polymers to a spinning machine.*

Research—a Major Du Pont Activity

Nylon is an excellent example of modern research at work at Du Pont. Young scientists joining the organization now may share in other discoveries of outstanding importance. They may find opportunities in such challenging fields as finishes, coated fabrics and various fibers; synthetic organic chemicals, including fine chemicals; synthetic rubber; electro and agricultural chemicals; plastics; pigments and photographic film; and high pressure synthesis.

Each of ten manufacturing departments of Du Pont has its own staff and is operated much like a separate company. Within each, research men work in groups small enough to bring quick recognition of individual talent and capabilities.

Year after year, young, inquiring minds come from leading U.S. schools of science and engineering to Du Pont — where individual ambition is matched with opportunity, cooperation and the type of friendly support that brings out the best in each person.

You'll want to read this free booklet

"Du Pont Company and the College Graduate" is just off the press in a completely revised edition. Fully illustrated—describes opportunities in research, production, sales, and many other fields. Explains the plan of organization whereby individual ability is recognized and rewarded. Write for your copy today. Address: 2521 Nemours Building, Wilmington 98, Del.

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More facts about Du Pont — Listen to "Cavalcade of America" Monday Nights, NBC Coast to Coast

CAMPUS SURVEY . . .

Concluded From Page 15

its advisor The Reverend F. Leroy Brown, and is practicing for the coming season every Wednesday noon.

The Rifle Club, another of our more active clubs, held elections and chose James Morris as President, with Gene Clingerman as Vice President, and Jayson Brentlinger as Sec. & Treas.

Homecoming Plans

With the coming of fall, the thoughts of the students naturally turn to the biggest event of the year, homecoming. The freshmen, having been duly impressed with the importance of the occasion, are finally erecting a bonfire after a slow start. Rosie is being prepared for her annual homecoming trip into town, under the guidance of the greencaps, and the school in general is taking on an air of fall festiveness.

The football team under the able supervision of Coach Brown is feverishly approaching top notch condition for their tilt with Earlham in the afternoon. Saturday night there will be a dance at the Armory. Judging from other occasions similar to this one, there will be a great demand for cider this year; consequently, several of our organizations are laying in sufficient supplies.

Intramural Baseball

During August, the intramural baseball tournament under the supervision of Jim Carr established the "Old Men" as league champions. Members of the old men's team were younger faculty men and last term seniors, while the other four teams were composed of next season's varsity hopefuls.

After the league windup, the "Old Men" met the "All-Stars", a team selected from the remaining teams, and in a seven-inning slugfest defeated them to the tune of eleven to ten. The "Old Men" did not lose a single game throughout the season.

Radio Club News

Ragsdale gets the far ones, Professor Moench gets the near one. This terms activities have seemingly justified the Radio Club's expenditures on equipment with contacts on ten meters in the Canal Zone. aboard U. S. S. Whittier Hills in the Caribbean Sea: North Hampton, Mass.; Hagerstown; New Mexico; and Lerna, Illinois.

The Canal Zone contact enabled KZ5AY's wife to talk to her parents here in Terre Haute via a phone call, a fast auto ride and the facilities of W9NAA. The Rose Tech Rado station at that time was ably manned by Bob Ragsdale and Paul Ford.

The radio club hopes to continue and extend its activities during the remainder of this term and next term, when a new 6-10 meter transmitter now under construction will be placed in operation.

Blue Key

As homecoming draws near, the Blue Key fraternity is preparing to take charge of the festivities as usual. Plans are already under way concerning the dance and the other activities that go to make up a successful reunion of old classmates.

The fraternity's ranks have been swelled with the recent tapping of a new pledge class. The men selected were James Bowman, Fred Corban, Robert Grant, Ben Miller, James Morris, William Orbaugh, Robert Royer, James Schwier, Robert Schwier, William Smock, John Winters, and Sydney Zeid.

There's something here no photograph could show

Pictures could convey a clear idea of the buildings of Standard Oil's new research laboratory at Whiting, Indiana. We could also photograph the many new types of equipment for up-to-date petroleum research that are housed in the laboratory, one of the largest projects of its kind in the world.

Or we could photograph the men who work here, many of whom have outstanding reputations in their fields. For many years, Standard Oil has looked for and has welcomed researchers and engineers of high professional competence. We have created an intellectual climate which stimulates these men to do their finest work.

But no photograph could show the basic idea that motivates Standard Oil research. It is simply this: our responsibility to the public and to ourselves makes it imperative that we keep moving steadily forward. The new Whiting laboratory is but one evidence of Standard Oil's intention to remain in the front rank of industrial research.

Standard Oil Company

(INDIANA)

910 S. MICHIGAN AVENUE, CHICAGO, ILLINOIS

STANDARD

STANDARD SERVICE

Concluded From Page 18

Wright-Patterson AFB, Ohio. Lt. Col. Halberstadt is a senior pilot with the Strategic Air Command and served thirty-nine months overseas during the war.

'42 Harold E. Bowsher has joined the Bowsher Insurance Agency in Terre Haute as head of the engineering and safety department.

'43 Mr. and Mrs. Willam T. Weinhardt have announced the birth of a daughter, Linda Yvonne, born last June 13. Congratulations from TECHNIC.

'45 Fred Maienschein, former editor of the TECHNIC, and Miss Joyce Kylander of Terre Haute were married August 14 at the Methodist Temple in Terre Haute. They will live in Bloomington, Indiana, while the bridegroom continues his graduate work at Indiana University. Best wishes from the TECHNIC.

'47 Harold R. Payne is now a Junior Engineer and part time student at the Chrysler Institute in Detroit.

Jack Fehrenbach is now with the A. Q. Smith Company in Milwaukee, Wisconsin.

Robert W. Wolf and Miss Marguerriete Wilson of Palestine, Illinois were married recently in Terre Haute. They are now at home in Schenectady, New York. Best wishes from the TECHNIC.

John T. Gundlach and Miss Ruth Arnold Shields were married in the First Methodist Church at Lewistown, Pennsylvania on September 14. Mr. Gundlach is a former instructor at Rose and is now doing graduate work in Oriental languages at Columbia University.

Change Jobs? Get Married? Addition to the Family? Your classmates are interested, so why not keep them informed by notifying the Alumni Editor?

Concluded From Page 4

up of a number of capacitors in paralled charged through resistors or inductances from rectifier units. Discharge of the capacitors is accomplished by means of gaps which spark over at predetermined voltages. Since the impulses occur at several million volts, the discharge tubes must have a high breakdown voltage. It was necessary during the early stages of development to improve the construction of the tubes because tube vacuum, electrode construction, and wall construction are factors affecting breakdown voltage. A new tube developed for the purpose is now incorporated within the Capacitron.

The Capacitron size and characteristics are given as follows:

Supply Voltage — 100 volts ac, converted to dc by rectifier
Number of Capacitor banks — 30
Peak output voltage — 3,000,000 volts
Magnitude of impulse discharge — Thousands of amperes
Time of discharge — 0.000001 sec.

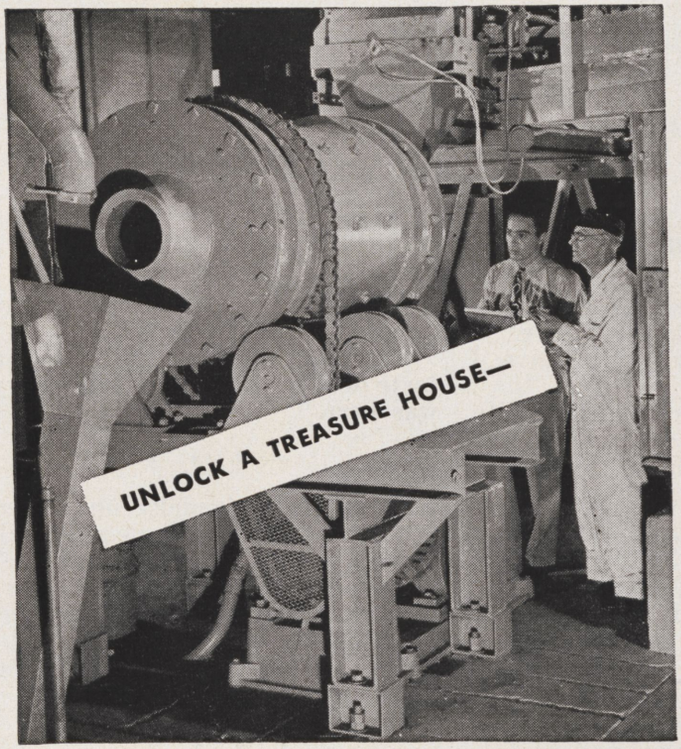
The author included a number of tables which presented results of the tests which were conducted with the Capacitron. Space permits only a general summary. One test illustrated the penetration range of electrons in water; a second provided a comparison between continuous and ultra-short time radiation, the continuous radiation causing the changes in color, odor, and appearance of food: and a third test showed the effect of radiation on hundreds of food samples which were given electron impulses, kept at room temperature, but were sealed off from the air.

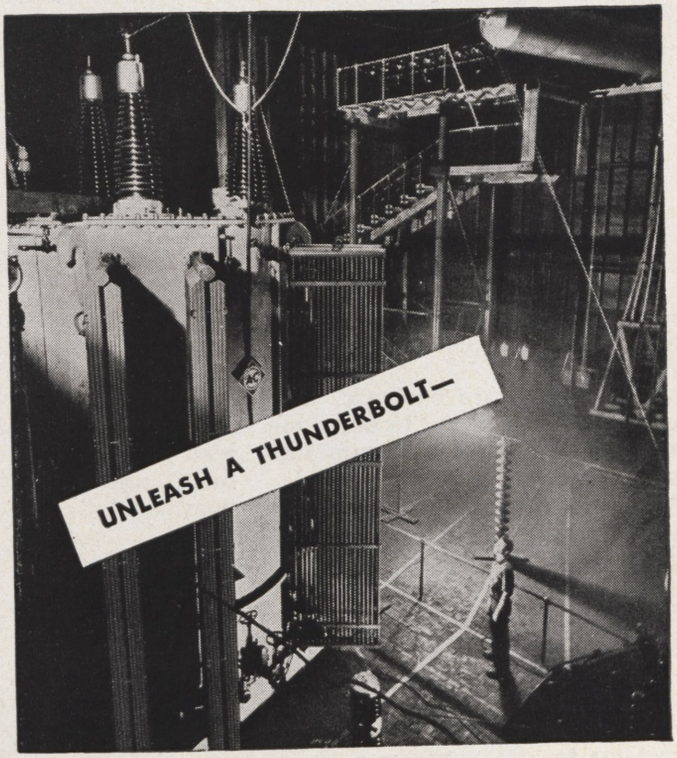
One result of continuous radiation was the effect on castor oil—it developed a fragrant odor of flowers after continuous exposure. Two extremes of effectiveness of the impulse test are given by the effects on lettuce and beef. The lettuce could not be preserved after any number of impulses. On the other hand, a sample of beef was given four impulses, was kept at room temperature for 264 days, and when the sample was removed from storage, it was just as fresh and had the same qualities as when it was placed under the Capactron. An untreated sample of the same beef decayed in two days. Both samples were kept at room temperature and were sealed from the air.

The author also found that the depth of penetration of the electrons determines the period of sterilization; that is, surface sterilization results in a shorter time period before the food will decay. Deeper penetration, on the other hand, requires higher voltages.

It has been predicted that the biggest advantage of the electronic Capacitron will be to reduce freezing costs by raising temperatures at which the foods can be kept in storage.

OPEN: New Fields to Explore!





AN Allis-Chalmers scientist seeks new, better ways to reduce low-grade ores . . .

. . . another hurls lightning at giant transformers to test abnormal stresses . . .

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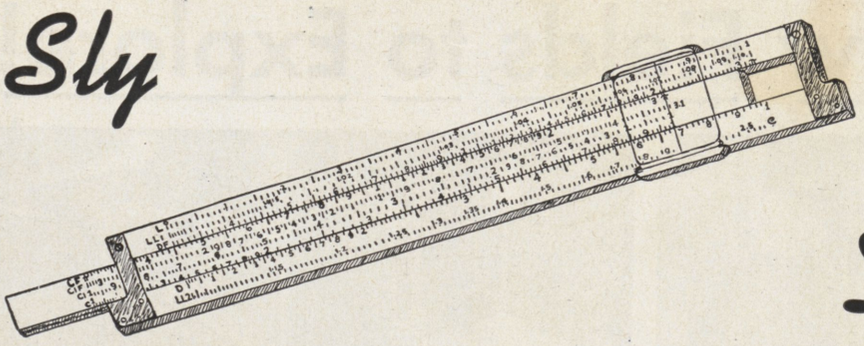
Sly Droolings



By Robert Campbell, sr., c.e.

A spy was being led to his execution by a squad of soldiers on a cold rainy morning.

"You soldiers are barbaric," the doomed spy grumbled, "to make me march through this cold rain like this."

"Quit squawking," snapped one of the soldiers, "We've got to walk back."

* * * *

A squad of recruits were out to the rifle range for their first try at marksmanship. They knelt at 250 yards and fired. Not a hit. They moved up to 200 yards and fired. Not a hit. They fired at 100 yards. Not a hit.

"Tenshun," barked the disgusted sergeant, "Fix bayonets. Charge, It's your only chance."

* * * *

Mrs. Jones was sitting in the breakfast nook shelling peas when she heard the back door open. Thinking it was her young son, she called "Here I am, darling."

Silence: Then a deep voice boomed, "This is not the regular iceman, Ma'am."

* * * *

Slow Suitor: "I'm very curious to know what you would say if I kissed you."

"If you were really curious, you would know by now."

* * * *

Lieutenant (in the mess hall, roaring with indignation): "Who told you to put these flowers on the table?"

Sergeant: "The Colonel, Sir."

Lieutenant: "Pretty, aren't they?"

* * * *

"Why the tooth brush in your lapel?"

"It's my school pin. . . I go to Colgate."

Wife: "I'll never go anywhere with you again as long as I live."

Husband: "Why, what have I done now?"

Wife: "You asked Mrs. Smith how her husband was standing the heat, and he's been dead two months."

* * * *

No man likes to be beaten to the punch, especially if there's gin in it.

* * * *

First Husband: "Do you believe in clubs for women?"

Second Husband: "Yes, if kindness fails."

* * * *

Doctor: "Your mother-in-law's condition necessitates a warmer climate."

Newly Wed (after a short pause) "You do it, Doc, I haven't the heart."

* * * *

The seven--year old son of a radio comedian came home with his report card.

"Well, son," asked the radio star, "Were you promoted?"

"Better than that, Pop," chirped the kid happily, "I was held over for another 26 weeks."

* * * *

Wifey: "How do you like my new gown? I got it for a ridiculous price."

Outraged Husband: "You mean you got it for an absurd figure."

* * * *

Disgusted Student: "I feel like telling that Professor where to go again."

Second Student: "What do you mean again?"

Disgusted Student: "I felt like it yesterday too."

Missionary: "Poor man. So you know nothing of religion."

Cannibal: "Oh yes, We got a taste of it when the last Missionary was here."

* * * *

Drunk (to splendidly uniformed bystander) : "Say, call me a cab will yuh?"

Splendidly Uniformed bystander: "My good man, I'm not a doorman; I'm a naval officer."

Drunk: "All right, then call me a boat. I gotta get home."

* * * *

Mother: "Now before you get serious with him, be sure he is always kind."

Daughter: "Oh, I'm sure he is; he told me that he put his shirt on a horse that was scratched."

* * * *

Divotdigging Golfer: "Well, caddy, how do you like my game?"

Caddy: "I guess it's all right, but I still prefer golf."

* * * *

A farmer and a professor were sharing a seat on a train. It was getting lonesome so the farmer started a conversation and they soon became a friendly pair.

"Let's have a game of riddles to pass the time," said the professor." "If I have a riddle that you can't guess you give me one dollar or vice versa."

"All right, replied the farmer, but as you are better educated than I am, do you mind if I only give fifty cents?"

"O. K." replied the professor. "You go first."

"Well, what animal has three legs walking and two legs flying?"

"I don't know. Here's your dollar. What's the answer?"

"I don't know either. Here's your fifty cents," answered the farmer.

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